TECHNICAL NOTES

LAKE STATES FOREST EXPERIMENT STATION
UNIVERSITY FARM ST. PAUL, MINNESOTA

Fertilized Nursery Stock Shows Increased Nursery Production and Higher Field Survival

Considerable controversy has occurred over the question of what effect fertilization in the nursery has on field survival. Some planters believe in the theory that since planting sites for species like jack pine are low in fertility, the nutrient level in the nursery should be held down to "adapt" the stock to the prospective planting site. Others believe in maintaining an abundant supply of nutrients.

To test these theories under actual field conditions, a comprehensive series of experiments was started at Hugo Sauer Nursery, Rhinelander, Wisconsin. One of these experiments dealt with 1-0 jack pine and the nursery and field results are listed below. The field planting was done in furrows. The soil was a fine sand containing 14.3 percent of silt and clay in the top 18 inches of soil. The site had a light cover of aspen 2 to 3 inches in diameter. Four replications of 200 trees were used for each treatment in the field test. The nursery soil previous to fertilization showed the following analysis: silt + clay, 12 percent; total nitrogen, 0.081 percent; base exchange capacity, 4.42 milliequivalents per 100 grams; available phosphorus, 77 parts per million, available potash, 115 parts per million. The fertilizers were spaded into the top 6 inches of soil a few days before sowing the seed. Seedling stand was 50 per square foot.

Nursery treatment per acre	Classification of nursery stock[2]			Second-year field survival (thrifty trees)
	Plantable	Good	Excellent	
	Percent	Percent	Percent	
No treatment	60	12	7	69.6
8 tons compost[1]	92	45	22	73.0
20 tons peat (ovendry basis)	87	30	10	77.3
20 tons dry peat + 400 pounds 20-percent ammonium sulphate + 600 pounds 20-percent superphosphate + 160 pounds 50-percent potash	100	67	47	77.0
400 pounds 20-percent ammonium sulphate + 600 pounds 20-percent superphosphate + 160 pounds 50-percent potash	95	22	12	70.7

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[1] Compost consisted of hardwood-hemlock duff, acid peat from spruce swamps, and complete N, P, K commercial fertilizers. Applied on ovendry-weight basis.

[2] In rating the nursery stock, plantable trees have stem caliper of 4/64 inch or greater; good, 5/64 inch caliper or greater; excellent, 6/64 inch caliper or greater. All the stock had good balance.

It will be noted that all of the fertilizer treatments produced a higher field survival and also higher percent of plantable stock than the untreated beds. Culling is an expensive operation, especially where cull percent runs up to 30 or 40 percent. On the basis of the above data an investment ranging from $30 to $80 per acre for fertilizers and labor resulted in an increased value of stock amounting to $150 per acre for each 10 percent increase of plantable stock, using an assigned value of $1 per M for 1-0 jack pine stock.

No. 169

May 1940

Assistance in the preparation of this material was furnished by the personnel of the Work Projects Administration, C.P. 665-71-3-69 and O.P. 01-2-71-126.

MAINTAINED BY THE UNITED STATES DEPARTMENT OF AGRICULTURE IN COOPERATION WITH THE UNIVERSITY OF MINNESOTA